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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/705,728	11/10/2003	William M. Hiatt	2269-5558E US (99-0253.04)	5029
24247	7590	08/22/2005	EXAMINER	
TRASK BRITT P.O. BOX 2550 SALT LAKE CITY, UT 84110			KOSOWSKI, ALEXANDER J	
			ART UNIT	PAPER NUMBER
			2125	

DATE MAILED: 08/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/705,728

Applicant(s)

HIATT ET AL.

Examiner

Alexander J. Kosowski

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 May 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,9,13-29 and 31-33 is/are rejected.
- 7) ☒ Claim(s) 3-8,10-12 and 30 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3/7/05
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

RD

DETAILED ACTION

1) Claims 1-33 are presented for examination in light of the amendment filed 5/11/05. This is a second non-final rejection.

Specification

2) The objection to the abstract from the previous office action is withdrawn in light of the amendment filed 5/11/05

Allowable Subject Matter

3) Claims 3-8, 10-12 and 30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Referring to claims 3, 10 and 30, neither Jensen (USPGPUB 2001/0032111) nor Zhang (U.S. Pat 6,158,346), together or in combination with the prior art of record explicitly teach a method for supporting a substrate during programmed material consolidation comprising disposing a retention lip extending laterally from a raised element over at least a portion of a periphery of a major surface of a substrate, disposing an extension element on an upper surface of a raised element, nor dispensing unconsolidated material without introducing unconsolidated material onto structures that protrude from the substrate.

Referring to claims 4-8 and 11-12, the claims are dependent on claims 3 and 10 above, respectively, and would therefore also be allowable.

Claim Rejections - 35 USC § 112

4) The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5) Claims 1 and 25 are rejected under 35 U.S.C. 112.

Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: how unconsolidated material is prevented from contacting the bottom surface of the substrate. Claim 1 claims that the bottom surface of a secured substrate is prevented from being contacted by unconsolidated material, but does not explain how this is done or what allows it to do so. The claim cannot be clearly understood by the examiner.

Claim 25 is rejected under 35 U.S.C. 112 as being indefinite due to the term "substantially". The term substantially is not defined in the claim and the examiner cannot determine the scope of the term.

Claim Rejections - 35 USC § 103

6) The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7) Claims 1-2, 9, 13-24 and 32-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jensen (U.S. PGPUB 2001/0032111), further in view of Zhang (U.S. Pat 6,158,346).

Referring to claim 1, Jensen teaches a method for supporting a substrate comprising: securing the substrate in position over a support surface and preventing unconsolidated material

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from contacting a bottom surface of the substrate (Paragraphs 0042-0043). However, Jensen does not explicitly teach that this is done while one or more objects are being fabricated on or adjacent to the substrate by a programmed material consolidation process.

Zhang teaches a method for supporting a substrate during programmed material consolidation whereby the substrate is held on a support surface while objects are being fabricated on the substrate by programmed material consolidation (col. 5 lines 5-32).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to maintain the substrate on a support while one or more objects are being fabricated on the substrate by a programmed material consolidation process in the invention taught above since this would allow for high speed, direct layer-by-layer deposition of heterogeneous functional gradient parts (Zhang, col. 6 lines 28-30), which would enable construction of three dimensional objects (Zhang, col. 2 lines 4-6).

Referring to claim 2, Jensen teaches the method of claim 1, wherein securing the substrate in position over the support surface is effected by positioning the substrate at least partially within a receptacle formed by at least one raised element (Paragraph 0042).

Referring to claim 9, Jensen teaches the method of claim 2, wherein positioning the substrate comprises positioning the substrate within a receptacle formed by at least one raised element that substantially surrounds the substrate (Paragraph 0042).

Referring to claim 13, Jensen teaches the method of claim 2, wherein securing the substrate in position over the support surface includes applying a negative pressure to the bottom surface of the substrate (Paragraph 0042).

Referring to claim 14, Jensen teaches the method of claim 13, wherein securing the substrate in position over the support surface further includes positioning the substrate over a sealing element with a peripheral portion of the bottom surface of the substrate contacting the sealing element (Paragraph 0043).

Referring to claim 15, Jensen teaches the method of claim 14, further comprising: breaking a seal between the sealing element and the bottom surface of the substrate (Paragraph 0043, whereby the seal is broken when the substrate is removed from the carrier).

Referring to claim 16, Jensen teaches the method of claim 1, wherein securing the substrate in position over the support surface includes applying a negative pressure to the bottom surface of the substrate (Paragraph 0042).

Referring to claim 17, Jensen teaches the method of claim 1, further comprising: removing the substrate from the support surface (Paragraph 0042, last 3 lines).

Referring to claim 18, Jensen teaches the method of claim 17, wherein removing the substrate comprises applying a positive pressure to the bottom surface of the substrate (Paragraph 0042, last 3 lines).

Referring to claim 19, Jensen teaches the method of claim 18, wherein applying a positive pressure to the bottom surface of the substrate includes creating a circulating air flow beneath the bottom surface of the substrate (Paragraph 0042).

Referring to claim 20, Jensen teaches the method of claim 19, wherein creating a circulating air flow beneath the bottom surface of the substrate causes the substrate to hover over the support surface (Paragraph 0042, whereby a positive pressure applied would cause the substrate to hover).

Referring to claim 21, Jensen teaches the method of claim 17, wherein removing the substrate comprises applying force to the bottom surface of the substrate (Paragraph 0042, last 3 lines).

Referring to claim 22, Jensen teaches a method, comprising: positioning at least one substrate in a receptacle of a retention system including a raised periphery that laterally surrounds the at least one substrate (Paragraph 0042). However, Jensen does not specifically teach introducing unconsolidated material onto a surface of the at least one substrate and programmably consolidating at least portions of the unconsolidated material.

Zhang teaches a method for supporting a substrate during programmed material consolidation whereby the substrate is held on a support surface while objects are being fabricated on the substrate by programmed material consolidation (col. 5 lines 5-32).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to maintain the substrate on a support while one or more objects are being fabricated on the substrate by a programmed material consolidation process in the invention taught above since this would allow for high speed, direct layer-by-layer deposition of heterogeneous functional gradient parts (Zhang, col. 6 lines 28-30), which would enable construction of three dimensional objects (Zhang, col. 2 lines 4-6).

Referring to claims 23-24, Jensen teaches the above. However, Jensen does not explicitly teach introducing unconsolidated material comprises forming a layer of unconsolidated material of a desired thickness over the at least one substrate, then selectively consolidating regions of the layer, nor repeating the acts of forming and selectively consolidating at least once.

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Zhang teaches selectively consolidating regions of unconsolidated material repeatedly to form layers (col. 5 lines 5-32).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to consolidate unconsolidated material in layers repeatedly in the invention taught above since this would allow for high speed, direct layer-by-layer deposition of heterogeneous functional gradient parts (Zhang, col. 6 lines 28-30), which would enable construction of three dimensional objects (Zhang, col. 2 lines 4-6).

Referring to claim 32, Jensen teaches preventing material from contacting the bottom surface of a substrate (Paragraph 0043).

Referring to claim 33, Jensen teaches the above. However, Jensen does not explicitly teach removing the at least one substrate from the receptacle following programmably consolidating at least portions of the unconsolidated material.

Zhang teaches removing the substrate after programmably consolidating (col. 5 lines 34-33).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to remove the substrate following consolidation in the invention taught above since this would allow for the finished product to be utilized.

8) Claims 25-29 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jensen, further in view of Zhang, further in view of Huang (U.S. PG PUB 2003/0173713).

Referring to claims 25-29 and 31 Jensen and Zhang teach the above. However, they do not explicitly teach substantially filling the receptacle with unconsolidated material, nor

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planarizing the surface of the unconsolidated material within the receptacle via a blade, nor dispensing material in a laminar flow, nor removing excess material.

Huang teaches a method of stereolithography whereby a substrate is filled with unconsolidated material via a laminar flow and whereby a wiping blade is used to planarize the surface of the material and remove extra material (Paragraph 0004).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to utilize fill a substrate via a laminar flow with unconsolidated material and planarize the surface with a blade to remove extra material in the invention taught above since this process can be repeated and utilized to create a plastic article having dimensions and shape of a desired 3-D object to be produced (Huang, Paragraph 0004).

Referring to claim 28, Jensen and Zhang teach the above. However, they do not explicitly teach spraying unconsolidated material onto the substrate.

Huang teaches a method of stereolithography whereby material is sprayed on the substrate (Paragraph 0033).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to spray material in the invention taught above since this would allow material to permeate through gaps between fine solid particles (Huang, Paragraph 0033).

Response to Arguments

9) Referring to applicants arguments regarding claim 18, examiner notes that a “change in pressure” as stated in the specification of Jensen could be considered a “positive pressure”.

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Referring to arguments regarding claim 19, examiner notes the claim does not state a “circular” airflow but rather a “circulating” air flow. A “change in pressure” as stated in the specification of Jensen could create a circulating air flow.

Referring to arguments regarding claim 20, examiner notes that changing pressure from a vacuum to a positive air pressure could cause a substrate to hover for a period of time.

Referring to arguments regarding claim 21, examiner notes that a “change in pressure” as stated in the specification of Jensen could be considered applying a force.

All other arguments are rendered moot in view of the new rejection above.

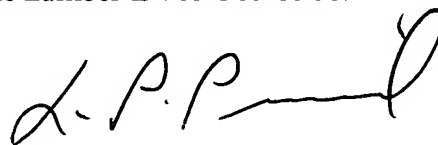
Conclusion

10) Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander J Kosowski whose telephone number is 571-272-3744. The examiner can normally be reached on Monday through Friday, alternating Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Leo Picard can be reached on 571-272-3749. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. In addition, the examiner’s RightFAX number is 571-273-3744.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Alexander J. Kosowski
Patent Examiner
Art Unit 2125



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SUPERVISORY PATENT EXAMINER
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